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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,980	07/11/2005	Carsten Deppe	DE 030022	8739

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EXAMINER

WILLIAMS, DON J

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/541,980	Applicant(s) DEPPE ET AL.	
	Examiner Don Williams	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8-12 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11 July 2005</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

Claims 1, 3, and 4-5 are objected to because of the following informalities:

Claims 1, 4, lines 4-5 recites the limitation "the forward direction operating mode or in the reverse direction". There is insufficient antecedent basis for this limitation in the claim. Replace "the forward direction" with --a forward direction--; replace "the reverse direction" with --a reverse direction--.

Claim 3, lines 2-4 recites the limitation "the minus pole of the first current source (I1) is connected to the cathode of the photodiode (1) and the plus pole". There is insufficient antecedent basis for this limitation in the claim. Replace "the minus pole" with --a minus pole--; replace "the cathode" with --a cathode--; replace "the plus pole" with --a plus pole--; replace "the anode" with --an anode--.

Claim 5, lines 2-3 recites the limitation "the first current source (I1), the second current source (I2), the DC voltage across the photodiode (1), preferably below 200 mV". There is insufficient antecedent basis for this limitation in the claim. Replace "the first current" with --a first current--; replace "the second current" with --a second current--; replace "the DC voltage" with --a DC voltage--; the phrase "preferably below" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Claverie et al (5,889,605).

As to claim 1, Claverie et al disclose (fig. 3) a photodiode (2) for receiving a light signal and generating an output signal (I_{PH}), characterized in that the photodiode (2) can be operated in the forward direction operating mode (forward bias) or in the reverse direction operating mode (reverse bias) and in that the remote control receiver has a current source (current generator, 11), a capacitor (12), and a diode (15) that integrally constitute a control unit that is used for setting the operating modes (forward/reverse bias) of the photodiode (2), (Abstract, column 4, lines 1-10, column 7, lines 22-24).

Claim 4, includes all the limitations of claim 1 (fig. 3) and as disclosed by Claverie et al (fig. 2, column 1, lines 55-65,) sets the operating mode (forward/reverse bias) of the photodiode (2) as a function of the signal level (P_{av} level) or useful signal level of its output signal (I_{PH}), (figure 4, figure 5, column 5, lines 18-23).

Claims 8 -11 are rejected under 35 U.S.C. 102(b) as being anticipated by Urala (4,805,236).

As to claim 8, Urala discloses (fig. 6c) a receiver having a photodiode (PD) for receiving a light signal and generating an output signal (I_d), characterized in that a number of photodiodes (D_6 , D_7 , D_8) having the same polarization are arranged as a series circuit and a controlled current source (control circuit, 62c) for generating the bias current (I_d) of the photodiode (PD) is connected in parallel with the diode series circuit, (column 6, lines 63-68, column 7, lines 1-12).

As to claim 9, Urala discloses (fig. 6e, column 7, lines 44-50) that transistor (Q5) and diode (D1) generate a control current ($nxld$) which is indicative of performing functions of a current regulator, and (column 1, lines 30-31) a field effect transistor serving as an adjustable resistance is part of the current source.

As to claim 10, Urala discloses (fig. 6c, column 6, lines 63-67), that the series circuit of photodiodes (D_6 , D_7 , D_8) is achieved by splitting the photodiode (PD) that is formed from (column 2, lines 28-30) a semiconductor diode configuration that is compatible to a chip or wafer.

As to claim 11, Urala discloses that the photodiodes (D_6 , D_7 , D_8) of the series circuit are identical, (figure 6c).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Claverie et al (5,889,605).

As to claim 2, Claverie et al disclose an arrangement that includes (Abstract, fig.3) one current source (current generator, 11) that is used integrally with the capacitor (12), and the diode (15) to automatically forward bias or reverse bias the photodiode (2). Claverie et al is silent as to disclosing a second current source. However, It would have been obvious for one of ordinary skill in the art to include a second dedicated current source to set the diode if desirous, in a forward or reverse bias state to improve the sensitivity of the receiver.

As to claim 3, Claverie et al is silent as to disclosing the arrangement as claimed. However, Claverie et al does disclose (fig. 3) that the current source (current generator, 11) is connected to the cathode (5) of the photodiode (2), (column 4, lines 54-56). It would have been obvious for one of ordinary skill in the art to modify Claverie et al to include a second current source having an arrangement as claimed to improve the switching of the forward and reverse bias state of the optical receiver.

As to claim 5, Claverie et al is silent as to disclosing that a first current source is set to zero. However, Claverie et al does disclose that during the forward direction operating mode (forward bias) of the photodiode (2), the current source (current generator, 11) is set or preprogrammed to output (current, I_{av}), (column 6, lines 35-45). Claverie et al (column 6, lines 49-51) also teach that because of the voltage drop between anode (3) and cathode (5) of the photodiode (2), the electric field in the intrinsic region (4) of the photodiode (2) becomes low which is indicative of the dc voltage across the photodiode being below its saturation voltage. It would have been obvious for one of ordinary skill in the art to modify Claverie et al to include a current source capable of being preprogrammed or set to generate a current that is higher than the current received by the photodiode to improve the sensitivity of the forward biasing state of the receiver.

As to claim 7, Claverie et al disclose (fig. 3) that the current source (current generator, 11), the capacitor (12) and the diode (15) integrally function as a controller that is capable of setting the forward direction operating mode (forward bias) for the photodiode (2) when the end of the received light is reached, (Abstract, column 4, lines 1-10, column 7, lines 22-24).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urala in view of Claverie et al (5,889,605).

As to claim 12, Urala disclose a (fig. 6c, column 6, lines 63-68, column 7, lines 1-23) receiver module for receiving a light signal, where the receiver module has at least a

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one photodiode (PD) for receiving the light signal and one current source (control circuit, 62c), a number of different or identical photodiodes (D_6 , D_7 , D_8) that are arranged as a series circuit are operated in the forward direction (forward bias) and when there is incident light, a photocurrent (I_d) is generated, and in that the AC portion of the photocurrent is decoupled by a transimpedance amplifier (A1). Urala is silent as to disclosing a saturation voltage. Claverie et al disclose a saturation voltage and a transimpedance amplifier (6), (figure 3, column 4, lines 65-67, column 5, lines 28-33). It would have been obvious for one of ordinary skill in the art to modify Urala to include a saturation voltage and a transimpedance amplifier as disclosed by Claverie et al to improve the sensitivity of the receiver by regulating the photodiode current.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to either singly or in combination disclose that the reverse direction operating mode of the photodiode is set when the signal level or useful signal level of the photodiode exceeds a predefined threshold.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Don Williams whose telephone number is 571-272-8538. The examiner can normally be reached on 8:30a.m. to 5:30a.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Georgia Epps
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